

REMARKS

The Office Action dated February 28, 2004, has been received and reviewed.

Claims 1-60 are currently pending and under consideration in the above-referenced application. Each of claims 1-60 stands rejected. Claims 21, 40, and 60 have also been objected to on the basis of form.

Reconsideration of the above-referenced application is respectfully requested.

Claim Objections

Claims 21, 40, and 60 have been objected to on the basis of form.

Claim 21 has been rejected because the Office deemed the recitation of “a material” at line 7 unclear in view of the prior recitation of “material” at line 4. While the recitation of “a material” at line 7 was sufficiently clear, claim 21 has been amended to more clearly recite that both of these incidences of “material” refer to the same material.

Claim 40 was objected to because the term “said” did not appear before the term “mapping.” Claim 40 has been amended to insert the term “the” before “mapping.”

Claim 60 was objected to on the basis that the second occurrence of the phrase “at least one logic circuit” did not clearly refer to a particular one of the previously recited logic circuits. Claim 60 has been amended to replace the second occurrence of the phrase “at least one logic circuit” with “at least one logic circuit for mapping,” which should provide the requisite clarity.

In view of the foregoing, it is respectfully requested that the objections to claims 21, 40, and 60 be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 21, 23, 32, 33, 36-38, 41, 49-54 stand rejected under 35 U.S.C. § 102(b).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed.

Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Pramanik

Claims 21, 23, 32, 33, and 36-38 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is allegedly anticipated by the subject matter described in U.S. Patent 5,852,497 to Pramanik et al. (hereinafter “Pramanik”).

Pramanik describes a process for locating or identifying conventional alignment marks on a substrate. Col. 1, lines 63-65; col. 10, lines 36-39. The alignment marks that are identified in the process of Pramanik comprise shallow trench isolation (STI) structures that are covered by one or more layers of opaque material. Col. 2, lines 60-63. The process of Pramanik is effected once the substrate has been brought to a desired destination. *See* col. 4, lines 10-26. When the substrate is at the desired destination and the alignment marks have been located or identified, one or both of the substrate and a reticle may be oriented in such a way that moved to align the substrate and the reticle with one another. Col. 3, line 45; *see also* col. 1, lines 27-30.

Independent claim 21 recites a method for determining a destination of a semiconductor device substrate. That method includes identifying a mark that comprises at least one recess within a surface of the semiconductor device substrate, which mark is covered with at least one layer of material. Such identification includes scanning electromagnetic radiation over a plurality of locations of the substrate, detecting locations at which an intensity of the electromagnetic radiation changes from substantially a baseline intensity, and correlating each such location to identify the mark. Once the mark has been identified, a predetermined destination for the substrate may also be identified.

The description of Pramanik is limited to finely aligning a semiconductor device substrate that has already been roughly positioned at a desired destination by recognizing the locations of features, such STI structures. *See* col. 1, lines 27-30. Thus, Pramanik includes no express or inherent description of identifying a mark.

Further, Pramanik includes no express or inherent description of identifying a predetermined destination for a semiconductor device substrate based on an identity of the mark. Notably, the Office has made no such assertion.

For these reasons, it is clear that Pramanik does not anticipate each and every element of independent claim 21. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 21 is allowable over Pramanik.

Each of claims 23, 32, 33, and 36-38 is allowable, among other reasons, as depending either directly or indirectly from claim 21, which is allowable.

Noguchi

Claims 41 and 49-54 stand rejected under 35 U.S.C. § 102(b) for being directed to subject matter which is purportedly anticipated by the disclosure of U.S. Patent 5,361,150 to Noguchi (hereinafter “Noguchi”).

Noguchi teaches liquid crystal displays (LCDs) with identification marks. The identification mark of an LCD according to Noguchi includes a character pad 13 that is formed in or from an opaque thin film 7. Col. 4, lines 10-20. Noguchi clearly indicates that “no opaque thin film is laminated on the character pad 13” (col. 4, lines 51-54), with the possible exception of a reflective lower metal film 17, which apparently facilitates unimpeded, direct viewing (from location 12 of FIG. 6) through a transparent glass substrate 1 over which the character pad 13 is formed (*see* col. 4, lines 59-64). Instead of an opaque material, only transparent films (lower and upper insulating films 8 and 11) are laminated over the character pad 13. Col. 4, lines 54-64. By ensuring that the character pad 13 is covered only with transparent materials, the identification mark formed thereby “can be visually viewed by a human being and by sensor devices.” Col. 5, lines 9-12.

Independent claim 41 is drawn to a system for identifying a marking on a substrate indicative of a type of semiconductor device being fabricated on the substrate and at least partially covered by at least one layer of material. The system of independent claim 41 includes, among other things, at least one radiation source configured and positioned to direct electromagnetic

radiation of at least one wavelength toward a substrate, the at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation. In addition, the system of independent claim 41 includes at least one reflectometer positioned so as to receive electromagnetic radiation of the at least one wavelength reflected from a location of the substrate covered with the material that is substantially opaque to at least some wavelengths of electromagnetic radiation.

Noguchi lacks any express description of a sensor device that includes a radiation source which is configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation.

As the character pad 13 of Noguchi may be “visually viewed by a human being and by sensor devices” (col. 5, lines 9-12), any sensor devices that are used to detect a marking formed by the character pad 13 need not include a radiation source configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation. Therefore, Noguchi also lacks any inherent description of a system with a radiation source configured and positioned to direct, toward a substrate, electromagnetic radiation of at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least some wavelengths of electromagnetic radiation.

As the disclosure provided by Noguchi does not expressly or inherently describe each and every element of independent claim 41, it is respectfully submitted that Noguchi does not anticipate each and every element of independent claim 41, as would be required to maintain the 35 U.S.C. § 102(b) rejection of independent claim 41.

Each of claims 49-54 is allowable, among other reasons, for depending either directly or indirectly from claim 41, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 102(b) rejections of claims 21, 23, 32, 33, 36-38, 41, 49-54 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-20, 22, 24-31, 34, 35, 39, 40, 42-48, and 55-60 have been rejected under 35 U.S.C. § 103(a).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Pramanik in View of Noguchi

Claims 1-3 and 6-18 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is purportedly unpatentable over the teachings of Pramanik, in view of teachings from Noguchi.

It is respectfully submitted that there is at least one reason that a *prima facie* case of obviousness has not been established against any of claims 1-3 or 6-18. In particular, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of Pramanik and Noguchi in the manner that has been asserted. Specifically, Noguchi teaches away from the subject matter taught in Pramanik, as well as that recited in claims 1-3 and 6-18. While the teachings of Pramanik and claims 1-3 and 6-8 are directed to techniques which include visualizing features (Pramanik) or characters (claims 1-3 and 6-18) through at least one layer of material which is opaque to at least some wavelengths of electromagnetic radiation, Noguchi clearly teaches limiting the layers that cover a marking to

transparent materials so that the markings can be visually detected. Col. 4, line 48, to col. 5, line 12.

Since Noguchi teaches away from the asserted combination, as well as from the subject matter recited in claims 1-3 and 6-18, it is apparent that the only way one of ordinary skill in the art would have been motivated to combine the teachings of Pramanik and Noguchi would have been through improper hindsight provided by the disclosure and claims of the above-referenced application.

Therefore, it is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 1-3 or 6-18. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), each of these claims recites subject matter which allowable over the teachings of Pramanik and Noguchi.

Pramanik

Claims 22, 26-31, 34, and 35 have been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over teachings from Pramanik.

Each of claims 22, 26-31, 34, and 35 is allowable, among other reasons, for depending from claim 21, which is allowable.

Pramanik in View of Noguchi and, Further, in View of Bareket

Claims 4, 5, 19, 20, 24, 25, 39, and 40 are rejected under 35 U.S.C. § 103(a) for being drawn to subject matter which is purportedly unpatentable over the teachings of Pramanik, in view of teachings from Noguchi and, further, in view of the subject matter taught in U.S. Patent 5,889,593 to Bareket (hereinafter "Bareket").

Bareket describes an optical system and methods. The optical system of Bareket includes an angle-dependent reflectometer with multiple detection elements for detecting radiation which is reflected at different angles. In addition, that system includes a processing system that acquires and analyzes data of the detected, reflected radiation. The system of Bareket is useful for optically

inspecting semiconductor wafers, including the widths of conductive lines (or “periodic text patterns”) on the surfaces of the semiconductor wafers.

Each of claims 4, 5, 19, 20, 24, 25, 39, and 40 is allowable since Bareket does not remedy the fact that Noguchi teaches away from the combination thereof with Pramanik, as well as from the subject matter recited in claims 4, 5, 19, 20, 24, 25, 39, and 40.

Claims 4, 5, 19, and 20 are also allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Each of claims 24, 25, 39, and 40 is also allowable, among other reasons, for depending either directly or indirectly from claim 21, which is allowable.

Noguchi in View of Duncan

Claims 42-48 and 55-58 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly unpatentable over the subject matter taught in Noguchi, in view of teachings from U.S. Patent 4,585,931 to Duncan et al. (hereinafter “Duncan”).

Each of claims 42-48 and 55-58 is allowable, among other reasons, for depending either directly or indirectly from claim 41, which is allowable.

Bareket in View of Noguchi.

Claims 59 and 60 stand rejected under 35 U.S.C. § 103(a) for being directed to subject matter which is purportedly unpatentable over the teachings of Bareket, in view of teachings from Noguchi.

Independent claim 59 is directed to a processor for characterizing at least one material-covered recessed marking formed in a substrate and a type of semiconductor device being fabricated on the substrate. The processor of independent claim 59 includes at least one logic circuit for comparing a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate, as well as at least one logic circuit for mapping a plurality of locations of said substrate where said measured intensity differs from said baseline intensity. The resulting map comprises a

digital image of the recessed marking. The processor of independent claim 59 also includes at least one logic circuit for identifying a type of semiconductor device that corresponds to the mapped locations.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against amended independent claim 59 for at least two reasons.

First, it is respectfully submitted that neither Bareket nor Noguchi teaches or suggests a processor which is configured to compare a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate and, based upon such comparison, to map locations where the baseline intensity and the measured intensity differ from one another. Rather, the teachings of both Bareket and Noguchi are limited to conventional optical recognition systems, in which a planar portion of a substrate need not be used as a reference point.

Second, since neither Bareket nor Noguchi teaches or suggests a logic circuit which is configured to map a plurality of locations on a substrate where a measured intensity differs from a baseline intensity at a planar region of a substrate to generate a digital image of a recessed marking formed in the substrate, neither of these references could motivate one of ordinary skill in the art to develop a processor with such a logic circuit.

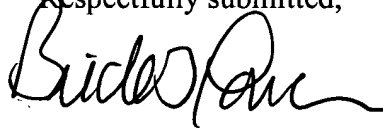
Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), amended independent claim 59 is allowable over the combination of Bareket and Noguchi.

Claim 60 is allowable, among other reasons, for depending from claim 59, which is allowable.

CONCLUSION

It is respectfully submitted that each of claims 1-60 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



Brick G. Power
Registration No. 38,581
Attorney for Applicant
TRASKBRITT, PC
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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